Consolidated Health Informatics

Standards Adoption Recommendation

Clinical Encounters

Index

Summary

Domain: Clinical Encounters

Standards Adoption Recommendation:
Health Level Seven® (HL7®) Version 2.4+

SCOPE
An encounter serves as a focal point linking clinical, administrative and financial information. Encounters occur in many different settings -- ambulatory care, inpatient care, emergency-care, home health care, field and virtual (telemedicine).

RECOMMENDATION
Health Level Seven® (HL7®), Version 2.4 and higher.

OWNERSHIP
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APPROVALS AND ACCREDITATIONS
HL7® is an ANSI-accredited Standards Developing Organization. This standard has been approved by full organizational ballot voting.

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Part I – Team & Domain Scope Identification

Target Vocabulary Domain

Clinical Encounter

The work group adopted the definition for clinical **encounter** from ASTM E1384-02a -- Standard Guide for Content and Structure of the Electronic Health Record: "(1) an instance of direct provider/practitioner to patient interaction, regardless of the setting, between a patient and a practitioner vested with primary responsibility for diagnosing, evaluating or treating the patient's condition, or both, or providing social worker services. (2) A contact between a patient and a practitioner who has primary responsibility for assessing and treating the patient at a given contact, exercising independent judgment." The ASTM definition excludes **ancillary service visit**, which is defined as "the appearance of an outpatient in a unit of a hospital or outpatient facility to receive service(s), test(s), or procedures." The clinical encounter definition also excludes practitioner actions in the absence of a patient such as **practitioner-to-practitioner interaction** and **practitioner-to-records interaction**.

Encounter serves as a focal point linking clinical, administrative and financial information. Encounters occur in many different settings -- ambulatory care, inpatient care, emergency care, home health care, field and virtual (telemedicine).

Sub-domains

Domain/Sub-domain	In-Scope (Y/N)
Clinical Encounters	Y
Admission Information	Y
Transfer (Patient Movement) Information	Y
Discharge Information	Y
Provider Information	Y
Accident Information	Y
Death and Autopsy Information	Y
Allergy Information	*N*
Demographics	*N*
Diagnosis/Problem Lists	*N*
Financial/Payment	*N*
Insurance Information	*N*
Interventions/Procedures	*N*

Information Exchange Requirements (IERs)

Beneficiary Tracking Information
Cost Accounting Information
Customer Demographic Data

Encounter (Administrative) Data
Patient Schedule
Provider Demographics

Team Members

Name	Agency/Department
Gregg Seppala (Team Lead)	**VA**
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Work Period

Start	End
February 19, 2003	June 10, 2003
October 2, 2003	DEC 2003

Part II – Standards Adoption Recommendation

Recommendation *Identify the solution recommended.*

The workgroup recommends adoption of Health Level Seven® (HL7®), Version 2.4 and higher, with identified gaps to be addressed in the future. The work group's specific recommendations for data elements and value sets are contained in **"*CHI Encounter Data Elements.doc*".**

The HL7® v2.4 Application, Transfer and Discharge (ADT) message consists of 25 message segments and 612 data fields. The work group identified 92 of the 612 data fields as falling within the scope of clinical encounter (See the "***HL7®-ADT-dataElements-scopeAnalysis.xls***" spreadsheet for the complete analysis including all value sets considered by the work group). The team concluded that 37 of the data fields require no further standardization because they hold date and time (16 data fields), yes/no responses (10 data fields), text (6 data fields), address (1 data field), telephone (1 data field), organization name (1 data field) or number (2 data fields) data.

The work group makes the following recommendations for the 17 data fields that hold identifiers. Visit id (2 data fields) does not require standardizing. Healthcare facility (1 data field) and practitioner (7 data fields) should use National Provider System identifiers once they are available. Location identifier (7 data fields) cannot be standardized across facilities at this time but doing so should be a future goal.

The HL7® v2.4 standard specifies value sets for only 3 of the 38 clinical encounter coded data fields. The other 35 data fields in the standard reference "user-defined" tables that may contain suggested values (i.e., values to be "used where applicable within an institution and serve as a basis for extensions as required"). However, interoperability among federal agencies requires that CHI specify the value sets to be used for these data fields in messages so the work group makes the following recommendations.

The work group recommends using externally defined value sets for eight of the clinical encounter coded data elements to conform to common usage. Ten of the remaining coded data fields have acceptable suggested value sets in the HL7® v2.4 standard. HL7® v2.5, which was approved as an ANSI standard on June 26, 2003, added acceptable suggested value sets for seven additional coded data fields. HL7® v3 vocabulary version 188 includes value sets for four of the coded data fields that do not have suggested values in either HL7® v2.4 or v2.5. That leaves six coded data fields with no suggested values.

The following tables (with notes) summarize the team's recommendations for value sets to use when exchanging clinical encounter messages.

Coded Fields with HL7®-defined Value Sets (v2.4)

Element Name	Element Id	Domain	Table
Event Type	9	Encounter	HL0003

Action Code	816	Provider	HL0287
Role-ROL	1197	Provider	HL0443

Coded Fields with Externally Defined Value Sets

Element Name	Element Id	Domain	Source
Admission Type	134	Admission	UB92 FL19
Admit Source	144	Admission	UB92 FL20
Discharge Disposition	166	Discharge	UB92 FL22
Expected Discharge Disposition	728	Discharge	UB92 FL22
Provider Type	1510	Provider	Healthcare Provider Taxonomy
Accident Code	528	Accident	ICD-9 E codes
Auto Accident State	812	Accident	FIPS 5-2
Death Cause Code	1574	Death and Autopsy	ICD-10

Coded Fields with HL7® Suggested Value Sets (v2.4)

Element Name	Element Id	Domain	Table
Event Reason Code	102	Encounter	HL0062
Patient Class *(1)*	132	Encounter	HL0004
Ambulatory Status	145	Encounter	HL0009
Visit Priority Code	726	Admission	HL0217
Mode of Arrival Code *(2)*	1543	Admission	HL0430
Recreational Drug Use Code	1544	Transfer	HL0431
Admission Level of Care Code	1545	Admission	HL0432
Precaution Code	1546	Encounter	HL0433
Patient Condition Code	1547	Encounter	HL0434
Organization Unit Type *(3)*	1461	Provider	HL0406

Coded Fields with HL7® Suggested Value Sets (v2.5)

Element Name	Element Id	Domain	Table
Hospital Service *(4)*	140	Encounter	HL0069
Re-admission Indicator *(5)*	143	Admission	HL0092
Visit Publicity Code	722	Encounter	HL0215
Patient Status Code	725	Encounter	HL0216
Living Will Code	759	Encounter	HL0315
Organ Donor Code	760	Encounter	HL0316
Advance Directive Code	1548	Encounter	HL0435

Coded Fields with HL7® v3 Defined Value Sets

Element Name	Element Id	Domain	Value Set
Accommodation Code	182	Encounter	ActEncounterAccommodationCode

Diet Type	168	Encounter	ActDietCode
Transfer Reason	184	Transfer	TransferActReason
Admit Reason	183	Admission	x_ActEncounterReason

Coded Fields Without Defined Value Sets

Element Name	Element Id	Domain
Preadmit Test Indicator *(6)*	142	Admission
Discharged to Location *(7)*	167	Discharge
Servicing Facility *(8)*	169	Encounter
Recurring Service Code	732	Admission
Role Duration	1201	Provider
Role Action Reason	1205	Provider

Notes
(1) Consider adding Patient Classes for Home Health, Field, and Virtual.
(2) Consider harmonizing with DEEDS Mode of Transport to ED (data element 4.02)
(3) Consider harmonizing with Healthcare Provider Taxonomy organization types
(4) Need to develop full list of Hospital Services
(5) Appears to be a yes/no data element rather than a code
(6) Appears to be a yes/no data element rather than a code
(7) Appears to be a location id data element rather than a code
(8) Consider using National Provider Identifier for healthcare organizations rather than a code

Ownership Structure *Describe who "owns" the standard, how it is managed and controlled.*

Health Level Seven® is one of several ANSI-accredited Standards Development Organizations (SDOs) operating in the healthcare arena. Headquartered in Ann Arbor, MI, Health Level Seven® is like most of the other SDOs in that it is a not-for-profit volunteer organization. Its members-- providers, vendors, payers, consultants, government groups and others who have an interest in the development and advancement of clinical and administrative standards for healthcare—develop the standards. Like all ANSI-accredited SDOs, Health Level Seven® adheres to a strict and well-defined set of operating procedures that ensures consensus, openness and balance of interest. Members of Health Level Seven® are known collectively as the Working Group, which is organized into technical committees and special interest groups. The technical committees are directly responsible for the content of the Standards. Special interest groups serve as a test bed for exploring new areas that may need coverage in HL7®'s published standards.

Summary Basis for Recommendation *Summarize the team's basis for making the recommendation (300 words or less).*

1. The team assembled use cases to determine the breadth of clinical encounter. The team agreed that the term encounter should encompass all healthcare settings -- ambulatory, inpatient (acute, intermediate and long term), emergency, home health, field and virtual (telemedicine).
2. The team sought a definition for encounter to further clarify the scope. The team agreed on the definition for encounter found in ASTM E-1384-02a. This definition clarifies that clinical encounter excludes ancillary service visits and practitioner-to-practitioner interactions in the absence of a patient.
3. The team identified a standard set of data elements for encounter. The team started with the standard HL7® v2.4 Application, Transfer and Discharge (ADT) message consisting of 25 message segments and 612 data fields and selected 92 data fields as falling within the scope of clinical encounter.
4. The team concluded that 37 data elements need no further standardization because they hold date and time (16 data fields), yes/no responses (10 data fields), text (6 data fields), address (1 data field), telephone (1 data field), organization name (1 data field) or number (2 data fields) data. This left 17 data elements that hold identifiers and 38 data elements that hold codes.
5. The team compared the code sets from eight sources for each of the coded data elements and determined that none of the sources met all the needs but on the whole HL7® offered the most comprehensive vocabulary for the 38 coded data elements.

Conditional Recommendation *If this is a conditional recommendation, describe conditions upon which the recommendation is predicated.*

No conditions applied to recommendation. Gaps noted and addressed in "Gaps" section of report.

Approvals & Accreditations

Indicate the status of various accreditations and approvals:

Approvals & Accreditations	Yes/Approved	Applied	Not Approved
Full SDO Ballot	X		
ANSI	X		

Options Considered *Inventory solution options considered and summarize the basis for not recommending the alternative(s). SNOMED must be specifically discussed.*

ASTM E1384-02a Standard Guide for Content and Structure of the Electronic Health Record (EHR)
The work group concluded that E1384 offers the best definition for clinical encounter and adopted that definition to define the scope for our effort. However, E1384 does not contain significant clinical encounter data elements or value sets beyond those in the

HL7® v2.x ADT message specification.
ASTM E1633-02a Standard Specification for Coded Values Used in the Electronic Health Record The work group determined that E1633 offered coded values for only five of the 38 clinical encounter coded data elements. Of the five, one was derived from the UB-92 and another was derived from DEEDS.
X12N 837 Health Care Claim message The work group reviewed the Event type (Loop ID 2300) for clinical encounter data elements and value sets but was not able to identify any significant data elements or values sets beyond those in the HL7® v2.x ADT message specification.
SNOMED-CT The work group matched SNOMED® concepts to HL7® data fields but concluded that SNOMED® did not did not provide better coverage overall compared with the suggested values sets in HL7® at this time.
CMS Form HCFA-1450 (UB-92) The work group did recommend code sets from the UB-92 for several HL7® clinical encounter coded data fields. This was consistent with the HL7® standard that recommended using the UB-92 values for use in the United States.
CDCP Data Elements for Emergency Department Systems, Release 1.0 (DEEDS) The work group reviewed the DEEDS for data elements and code sets and recommended that several of the HL7® value sets be harmonized with codes in DEEDS.

Current Deployment

HL7® has a great deal of support in the user community and 1999 membership records indicate over 1,600 total members, approximately 739 vendors, 652 healthcare providers, 104 consultants, and 111 general interest/payer agencies. HL7® standards are also widely implemented though complete usage statistics are not available. In a survey of 153 chief information officers in 1998, 80% used HL7® within their institutions, and 13.5% were planning to implement HL7® in the future. In hospitals with over 400 beds, more than 95% use HL7®. As an example, one vendor has installed 856 HL7® standard interfaces as of mid 1996. In addition the HL7® standard is being used and implemented internationally including Canada, Australia, Finland, Germany, The Netherlands, New Zealand, and Japan. Anecdotal information indicates that the major vendors of medical software, including Cerner, Misys (Sunquest), McKesson, Siemens (SMS), Eclipsys, AGFA, Logicare, MRS, Tamtron, IDX (Extend and CareCast), and 3M, support HL7®. The most common use of HL7® is thought to be admission/discharge/transfer (ADT) interfaces, followed closely by laboratory results, orders, and then pharmacy. HL7® is also used by many federal agencies including VHA, DoD and HHS/CDC, hence federal implementation time and cost is minimized.

Part III – Adoption & Deployment Information

Provide all information gathered in the course of making the recommendation that may assist with adoption of the standard in the federal health care sector. This information will support the work of an implementation team.

Existing Need & Use Environment

Measure the need for this standard and the extent of existing exchange among federal users. Provide information regarding federal departments and agencies use or non-use of this health information in paper or electronic form, summarize their primary reason for using the information, and indicate if they exchange the information internally or externally with other federal or non-federal entities.

Column A: Agency or Department Identity (name)
Column B: Use data in this domain today? (Y or N)
Column C: Is use of data a core mission requirement? (Y or N)
Column D: Exchange with others in federal sector now? (Y or N)
Column E: Currently exchange paper or electronic (P, E, B (both), N/Ap)
Column F: Name of paper/electronic vocabulary, if any (name)
Column G: Basis/purposes for data use (research, patient care, benefits)

Department/Agency	B	C	D	E	F	G
Department of Veterans Affairs	Y	Y	Y	E	HL7®	Research Reporting
Department of Defense						
HHS Office of the Secretary						
Administration for Children and Families (ACF)						
Administration on Aging (AOA)						
Agency for Healthcare Research and Quality (AHRQ)						
Agency for Toxic Substances and Disease Registry (ATSDR)						
Centers for Disease Control and Prevention (CDC)						

Centers for Medicare and Medicaid Services (CMS)						
Food and Drug Administration (FDA)						
Health Resources and Services Administration (HRSA)						
Indian Health Service (IHS)						
National Institutes of Health (NIH)						
Substance Abuse and Mental Health Services Administration (SAMHSA)						
Social Security Administration						
Department of Agriculture						
State Department						
US Agency for International Development						
Justice Department						
Treasury Department						
Department of Education						
General Services Administration						
Environmental Protection Agency						
Department of Housing & Urban Development						
Department of Transportation						
Homeland Security						

Number of Terms

Quantify the number of vocabulary terms, range of terms or other order of magnitude.

Clinical encounter includes 38 coded data fields. The recommended value sets run from one term to several dozen terms.
How often are terms updated?

HL7® v2.x standards are issued every two to three years. HL7® V 3 vocabulary tables are updated three times per year.

Range of Coverage

Within the recommended vocabulary, what portions of the standard are complete and can be implemented now? (300 words or less)

The team concluded that by drawing value sets from HL7® v2.4, v2.5 and v3 and referencing external value sets for 8 data fields the standard for the 92 clinical encounter data elements was essentially complete with the following gaps:

- Explicit support for home health, field and virtual encounters
- Support for clinical services that do not meet definition of clinical encounter
- National Provider System identifiers for practitioners and healthcare organizations
- Standard location identifiers
- Standard hospital service names

Acquisition: *How are the data sets/codes acquired and use licensed?*

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Cost

What is the direct cost to obtain permission to use the data sets/codes? (licensure, acquisition, other external data sets required, training and education, updates and maintenance, etc.)

HL7® sells hard and computer readable forms of the various standard versions, cost from $50 - $500 depending on specific standard and member status. Draft versions of standards are available to all from their website. No specific cost is associated with using the standards.

Training is offered through HL7® and others are varying costs from several hundred to several thousand-dollars/per person. Consultation services are available at standard industry cost for training, update instillation and maintenance.

Systems Requirements

Is the standard associated with or limited to a specific hardware or software technology or other protocol?

No.

Guidance: *What public domain and implementation and user guides, implementation tools or other assistance is available and are they approved by the SDO?*

HL7® is in widespread use and has many implementation guides and tools, some in the public domain and some accessible by authorized personnel or organizations. Please refer to www.hl7.org for more details.

Is a conformance standard specified? Are conformance tools available?

Yes, HL7® v2.5 section 2.12 specifies Conformance Using Message Profiles. HL7® and VA jointly developed the public domain Messaging Workbench tool for validating message profiles against the standard.

Maintenance: *How do you coordinate inclusion and maintenance with the standards developer/owners?*

How do you coordinate inclusion and maintenance with the standards developer/owners? Voluntary upgrade to new versions of standards, generally by trading partner agreement. Messages are transmitted with version number and use of prior versions is generally supported for a period of time after introduction of a new one.

What is the process for adding new capabilities or fixes?
Continual review of in-use requirements of standard at organization meetings held three times/year.

What is the average time between versions?
Various, but approximately annually.

What methods or tools are used to expedite the standards development cycle?
None. Occurs at meetings held three times/year and in the workgroups between meetings. Standards development can be quite lengthy.

How are local extensions, beyond the scope of the standard, supported if at all?
Yes, but not encouraged (Z segment).

Customization: *Describe known implementations that have been achieved without user customization, if any.*

If user customization is needed or desirable, how is this achieved? (e.g, optional fields, interface engines, etc.)

None

Mapping Requirements

Describe the extent to which user agencies will likely need to perform mapping from internal codes to this standard.

Identify the tools available to user agencies to automate or otherwise simplify mapping from existing codes to this standard.

Compatibility

Identify the extent of off-the-shelf conformity with other standards and requirements:

Conformity with other Standards	Yes (100%)	No (0%)	Yes with exception
NEDSS requirements	**X**		
HIPAA standards	**X**		
HL7® 2.x	**X**		

Implementation Timeframe

Estimate the number of months required to deploy this standard; identify unique considerations that will impact deployment schedules.

Any estimate would differ by agency, due to the legacy systems currently in place that are using older versions of HL7®.

If some data sets/code sets are under development, what are the projected dates of completion/deployment?

The implementation time frame for the National Provider System is unknown at present.

Gaps

Identify the gaps in data, vocabulary or interoperability.

- Explicit support for home health, field and virtual encounters
- Support for clinical services that do not meet definition of clinical encounter
- National Provider System identifiers for practitioners and healthcare organizations
- Standard location identifiers
- Standard hospital service names

Refer to the attached document for specific issues.

Obstacles

What obstacles, if any, have slowed penetration of this standard? (technical, financial, and/or cultural)

If agencies have existing electronic health records then they may need to create data mappings and/or change value sets to implement HL7® ADT messages with the recommended value sets.

If agencies have only paper health records then implementing the HL7® ADT standard would be a large undertaking.

Appendix A

Information Exchange Requirements (IERs)

Information Exchange Requirement	Description of IER
Beneficiary Financial / Demographic Data	Beneficiary financial and demographic data used to support enrollment and eligibility into a Health Insurance Program.
Beneficiary Inquiry Information	Information relating to the inquiries made by beneficiaries as they relate to their interaction with the health organization.
Beneficiary Tracking Information	Information relating to the physical movement or potential movement of patients, beneficiaries, or active duty personnel due to changes in level of care or deployment, etc.
Body of Health Services Knowledge	Federal, state, professional association, or local policies and guidance regarding health services or any other health care information accessible to health care providers through research, journals, medical texts, on-line health care data bases, consultations, and provider expertise. This may include: (1) utilization management standards that monitor health care services and resources used in the delivery of health care to a customer; (2) case management guidelines; (3) clinical protocols based on forensic requirements; (4) clinical pathway guidelines; (5) uniform patient placement criteria, which are used to determine the level of risk for a customer and the level of mental disorders (6) standards set by health care oversight bodies such as the Joint Commission for Accreditation of Health Care Organizations (JCAHO) and Health Plan Employer Data and Information Set (HEDIS); (7) credentialing criteria; (8) privacy act standards; (9) Freedom of Information Act guidelines; and (10) the estimated time needed to perform health care procedures and services.
Care Management Information	Specific clinical information used to record and identify the stratification of Beneficiaries as they are assigned to varying levels of care.
Case Management Information	Specific clinical information used to record and manage the occurrences of high-risk level assignments of patients in the health delivery organization..
Clinical Guidelines	Treatment, screening, and clinical management guidelines used by clinicians in the decision-making processes for providing care and treatment of the beneficiary/patient.

Cost Accounting Information	All clinical and financial data collected for use in the calculation and assignment of costs in the health organization .
Customer Approved Care Plan	The plan of care (or set of intervention options) mutually selected by the provider and the customer (or responsible person).
Customer Demographic Data	Facts about the beneficiary population such as address, phone number, occupation, sex, age, race, mother's maiden name and SSN, father's name, and unit to which Service members are assigned
Customer Health Care Information	All information about customer health data, customer care information, and customer demographic data, and customer insurance information. Selected information is provided to both external and internal customers contingent upon confidentiality restrictions. Information provided includes immunization certifications and reports, birth information, and customer medical and dental readiness status
Customer Risk Factors	Factors in the environment or chemical, psychological, physiological, or genetic elements thought to predispose an individual to the development of a disease or injury. Includes occupational and lifestyle risk factors and risk of acquiring a disease due to travel to certain regions.
Encounter (Administrative) Data	Administrative and Financial data that is collected on patients as they move through the healthcare continuum. This information is largely used for administrative and financial activities such as reporting and billing.
Improvement Strategy	Approach for advancing or changing for the better the business rules or business functions of the health organization. Includes strategies for improving health organization employee performance (including training requirements), utilization management, workplace safety, and customer satisfaction.
Labor Productivity Information	Financial and clinical (acuity, etc.) data used to calculate and measure labor productivity of the workforce supporting the health organization.
health organization Direction	Goals, objectives, strategies, policies, plans, programs, and projects that control and direct health organization business function, including (1) direction derived from DoD policy and guidance and laws and regulations; and (2) health promotion programs.
Patient Satisfaction Information	Survey data gathered from beneficiaries that receive services from providers that the health organization wishes to use to measure satisfaction.

Patient Schedule	Scheduled procedure type, location, and date of service information related to scheduled interactions with the patient.
Population Member Health Data	Facts about the current and historical health conditions of the members of an organization. (Individuals' health data are grouped by the employing organization, with the expectation that the organization's operations pose similar health risks to all the organization's members.)
Population Risk Reduction Plan	Sets of actions proposed to an organization commander for his/her selection to reduce the effect of health risks on the organization's mission effectiveness and member health status. The proposed actions include: (1) resources required to carry out the actions, (2) expected mission impact, and (3) member's health status with and without the actions.
Provider Demographics	Specific demographic information relating to both internal and external providers associated with the health organization including location, credentialing, services, ratings, etc.
Provider Metrics	Key indicators that are used to measure performance of providers (internal and external) associated with the health organization.
Referral Information	Specific clinical and financial information necessary to refer beneficiaries to the appropriate services and level of care.
Resource Availability	The accessibility of all people, equipment, supplies, facilities, and automated systems needed to execute business activities.
Tailored Education Information	Approved TRICARE program education information / materials customized for distribution to existing beneficiaries to provide information on their selected health plan. Can also include risk factors, diseases, individual health care instructions, and driving instructions.